

ABSTRACT

A single lens element used for converting a divergent pencil
of rays, radiated from a light source, into a predetermined
5 convergent state, wherein

the single lens element is made from a resin and has a positive
optical power due to a refraction effect and a positive optical
power due to a diffraction effect,

the diffraction effect is based on a diffraction structure
10 formed on at least one of an incident side surface and an exit
side surface of the single lens element, and

the following expressions are satisfied:

$$0.1 < NA < 0.3$$

$$0.4 < T/f < 0.75$$

$$15 \quad 2.2 < fr/f < 3$$

here,

f is a focal length of the entire single lens element,

fr is a focal length due to the refraction effect of the
single lens element,

20 T is a thickness of the single lens element on an optical
axis, and

NA is a numerical aperture of a single lens element at an
incident side.